



R17 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 1P7BA

B.Tech IV Year I Semester Regular Examinations, February 2021

POWER SEMICONDUCTOR DRIVES

(Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 20.02.2021 Duration: 3

hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Three phase converters are better than single phase converters when harmonics are Considered? Will this advantage be of any use in motor drives?
- 2 What are the drawbacks of rectifier fed dc drives?
- 3 Define regenerative braking
- 4 Whether discontinuous conduction will occur in the operation of chopper fed dc drives and write voltage equation.
- 5 Why stator voltage control is suitable for speed control of induction motors in fan and pump drives
- 6 What are the various applications of stator voltage control scheme.
- 7 Compare static Kramer and Scherbius system
- 8 Illustrate the features of variable frequency control.
- 9 Why a self controlled synchronous motor is free from hunting oscillations?
- 10 How the stator and rotor of the synchronous motor are classified?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 A. Explain single phase fully controlled converter fed dc separately excited motor in Continuous conduction mode with necessary waveforms and steady state analysis.(7M)
B. A 200 V, 875 rpm and 200A separately excited dc motor has an armature resistance of 0.06 ohm. It is fed from a single phase fully controlled rectifier with an ac source voltage of 220V, 50 Hz. Assuming continuous conduction, calculate firing angle for rated motor torque and 750 rpm.(3M)

OR

- 12 Explain with wave forms the regenerative operation of three phase fully controlled rectifier control of separately excited DC motor. (10M)
- 13 A. Discuss the different control techniques of chopper in detail.(5M)
B. Discuss the four quadrant operation of DC-DC converter. (5M)

OR

- 14 Briefly explain the Electric braking of DC drives and AC drives. (10M)
- 15 A. Compare VSI and CSI fed induction motor drive. (5M)
B. Show and Explain the block diagram of vector control of induction motor drive(5M)
- OR
- 16 Discuss in detail with suitable diagrams and waveforms the v/f control of induction motor drives. (10M)
- 17 A. Explain conventional Scherbius drive. (5M)
B. Explain adjustable frequency constant air gap flux control method of speed control for induction motor drives. (5M)
- OR
- 18 A. Explain in detail the static rotor resistance control in induction motor. (5M)
B. Explain conventional Kramer system.(5M)
- 19 A. Discuss briefly separate controlled mode of synchronous motor in detail. (5M)
B. Explain self-control of synchronous motor drive in detail. (5M)
- OR
- 20 A. Describe the open loop v/f control of VSI fed synchronous motor in detail. (5M)
B. Briefly describe the CSI fed synchronous motor drive. (5M)